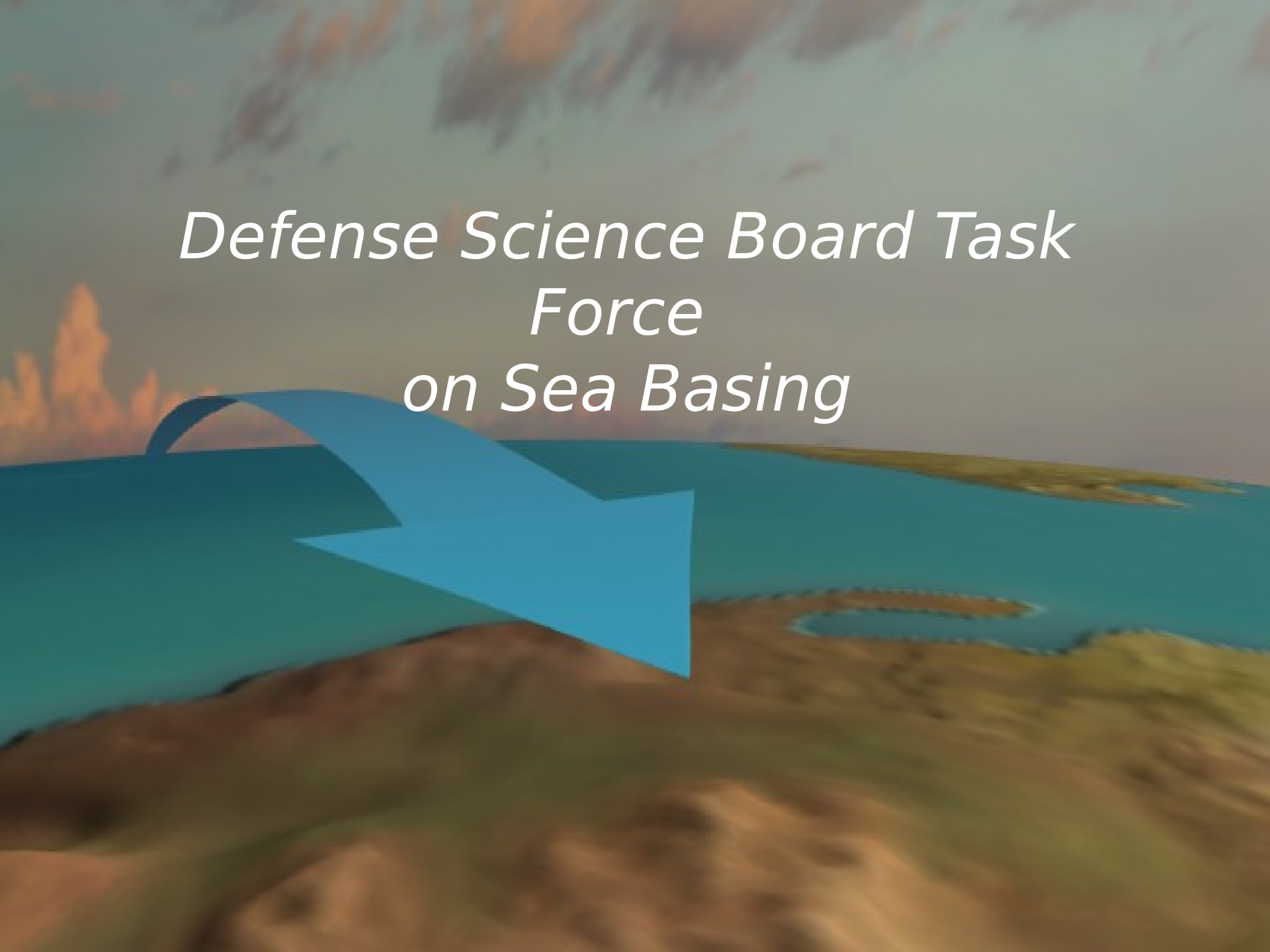

Defense Science Board Task Force
on Sea Basing

Sea Basing Task Force – TOR summary

You are requested to establish a Defense Science Board Task Force to:

- Assess how sea basing of expeditionary forces can best serve the nation's defense needs through at least the first half of the 21st century
- The 2001 QDR has reinforced the shift in the Navy's focus from open water to littoral regions.
  - Concentrate on the need for the presence and warfighting missions that expeditionary forces perform
  - Examine their utility and their potential for transformation
- The Navy and the Marine Corps have generated a concept for future expeditionary warfare, "Enhanced Network Sea Basing," which is to be the starting point for the study

Sea Basing Task Force – TOR summary

- Consider the operational requirements, the assets required, the role(s) of new technologies, and the effects of “jointness”
- Examine the future relationships of the Amphibious Ready Group, with embarked Marine Expeditionary Unit, Carrier Battle Group, Maritime Prepositioning Ship Squadron, Marine Expeditionary Brigade, Surface Action Group and the Combat Logistics Force in establishing the Enhance Network Seabase and implications for platform costs and capabilities.

Sea Basing Task Force – TOR summary

- Be guided by the following questions:
  - What is the naval environment expected to be for the next 20-50 years?
  - What is the role of naval forces in enabling access for joint forces through the world's littorals?
  - What assets and technologies are needed to establish a robust and capable Enhanced Networked Seabase?
  - How does the timing of the acquisition of the technologies, platforms and systems which replace legacy systems build up full capability from what it is now?
  - As new hardware is acquired, should the function each legacy platform performs remain the same or are the opportunities to relocate functionality to improve effectiveness, efficiency or economy?
  - Are there other Doctrine, Organizational, Training, Materiel, Leadership, Personnel or Facilities (DOTMLPF) aspect the affect the development?

Task force Membership

- Co-Chairmen
  - ADM Donald Pilling, USN (Ret)
  - Dr. William Howard
- Members:
  - ADM Stan Arthur, USN (Ret)
  - VADM Frank Donovan, USN (Ret)
  - Mr. Alan Ellinthorpe
  - Gen Richard Hearney, USMC (Ret)
  - Hon. Paul Kaminski
  - ADM Joe Lopez, USN (Ret)
  - Dr. Williamson Murray
  - Hon. Whit Peters
  - MG Robert Scales, USA (Ret)
  - Mr. Frank Sullivan
  - Gen Michael Williams, USMC (Ret)
- Executive Secretary
  - Dr. Paris Genalis
- DSB Representative
  - CDR David Waugh, USN
- Government Advisors
  - CAPT Don Babock, USN
  - MajGen James Battaglini, USMC
  - Ms. Sharon Beerman-Curitn
  - Mr. Stephen Benson
  - CDR Bud Bishop, USN
  - Col Arthur Corbett, USMC
  - Ms. Darlene Costello
  - Col Chandler Crangle, USMC (Ret)
  - RADM Lou Crenshaw, USN
  - BrigGen Michael Ennis, USMC
  - Mr. Gary Gisolo
  - BrigGen Kenneth Glueck, Jr. USMC
  - LtCol Anthony Greco, Jr. USMC
  - LCDR Brian Grimm, USN
  - LtGen Edward Hanlon, Jr. USMC
  - LtGen M.A. Hough, USMC
  - CAPT Linda Lewandowski, USN
  - Mr. Nicholas Linkowitz
  - LtGen Robert Magnus, USMC
  - Col William Murray, USMC
  - BrigGen Robert Neller, USMC
  - Mr. Patrick O'Bryan
  - Dr. Frank Shoup
  - Mr. James Strock
  - LTC Tom Tyra, USA
  - Mr. J. Noel WIlliams

Summary of Conclusions

- Sea basing - a ***critical future national competence*** for assuring access to areas where United States military forces are denied access to support facilities
- Future sea basing needs are ***well beyond*** today's USMC and Navy operating capabilities
- The complexity and difficulty of sea basing requires a ***coordinated, spiral development effort*** to address identified issues and create a joint sea basing system of systems
- The United States should ***realistically test*** its sea basing capabilities to work out problems and develop leadership skills in all Services

Sea Basing

- Exploitation of the strategic maneuver space of the world's oceans can provide United States forces the ability to project power from littoral areas anywhere
- Retention at sea of the logistical and C3I components of land warfare
  - Will increase speed in engaging the enemy
  - Will preserve the capability of deception
- Implementation of sea basing will require a "system of systems" development
  - Heavy-lift, sea-basable aircraft and the ships from which they operate
  - Solution to load transfer problems in challenging seas
  - High-capacity, high speed lighterage
  - Suppression of enemy mine, missile and submarine defenses
  - Broadband, shared data, reliable communications

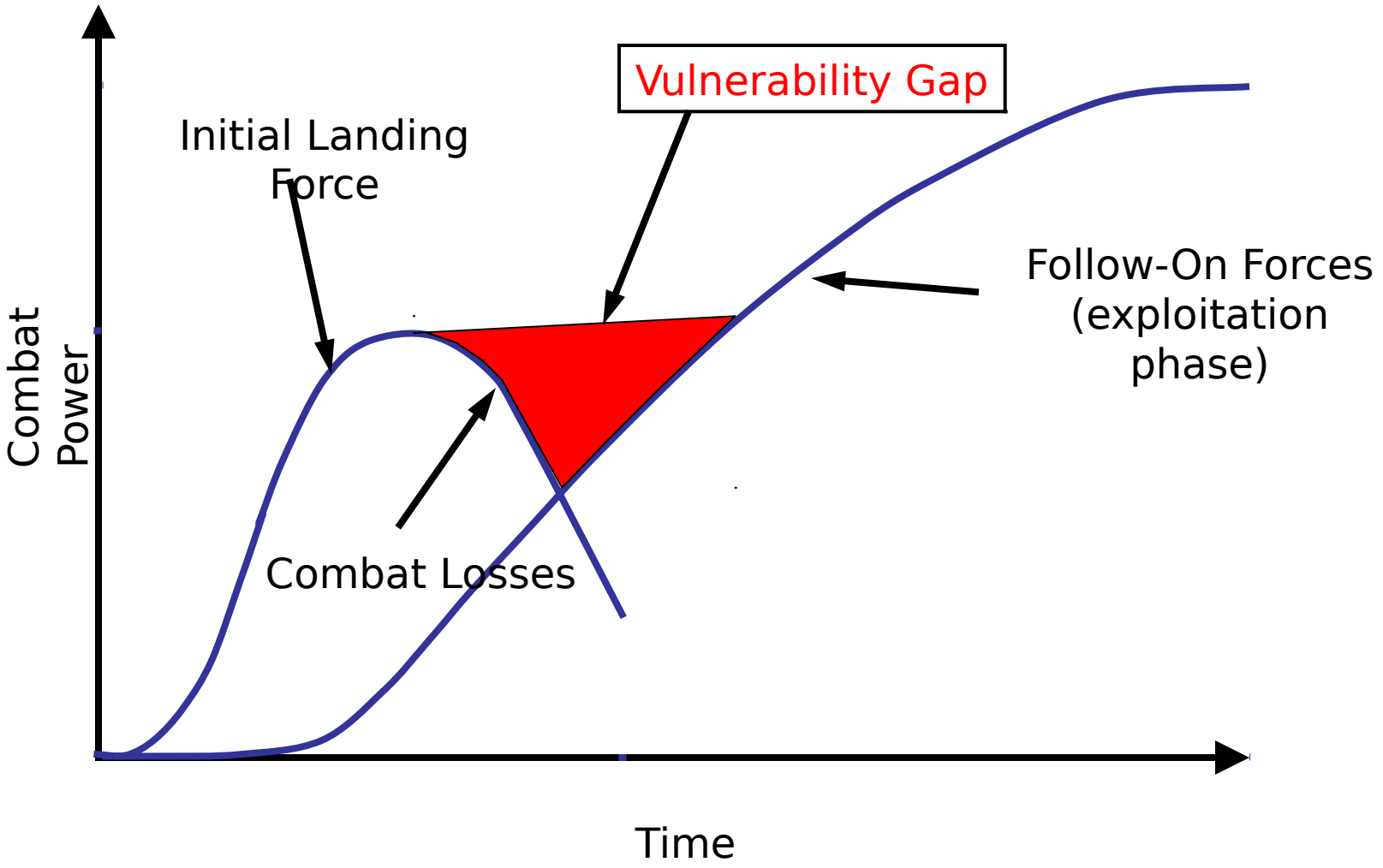
What's Different about Sea Basing?

- The United States has historically conducted forcible entry expeditionary operations across the shore
- In the future, in-theater land bases or traditional amphibious operations may no longer be feasible due to political considerations or enemy defensive capabilities
- A seabase represents a ***sovereign, maneuverable capability*** for rapidly projecting U.S. offensive and defensive power, as well as assembling, equipping, supporting and sustaining scalable forcible entry operations without the need for land bases in the JOA
- ***Sea basing expands current amphibious capabilities*** in both scale and scope to enable rapid response, deep, joint, prolonged operations

Why Seabase?

- Seabases would better enable rapid, substantial power projection from the sea
  - A counter to some area denial and anti-access measures
  - Expand the range of military options and complicate defense for potential adversaries
  - Minimize local/regional political sensitivities
  - Maneuver reduces vulnerability compared to large, fixed military presence ashore (APOD or SPOD)
  - Provides rapidly deployable, yet persistent capabilities
  - Closes the “vulnerability gap”
  - Less vulnerable to weapons of mass destruction
  - Likely to be the lynchpin for unilateral preventative action with both fires and maneuver operations
- Sea basing provides complementary and supporting joint force capabilities

Expeditionary Operations Profile



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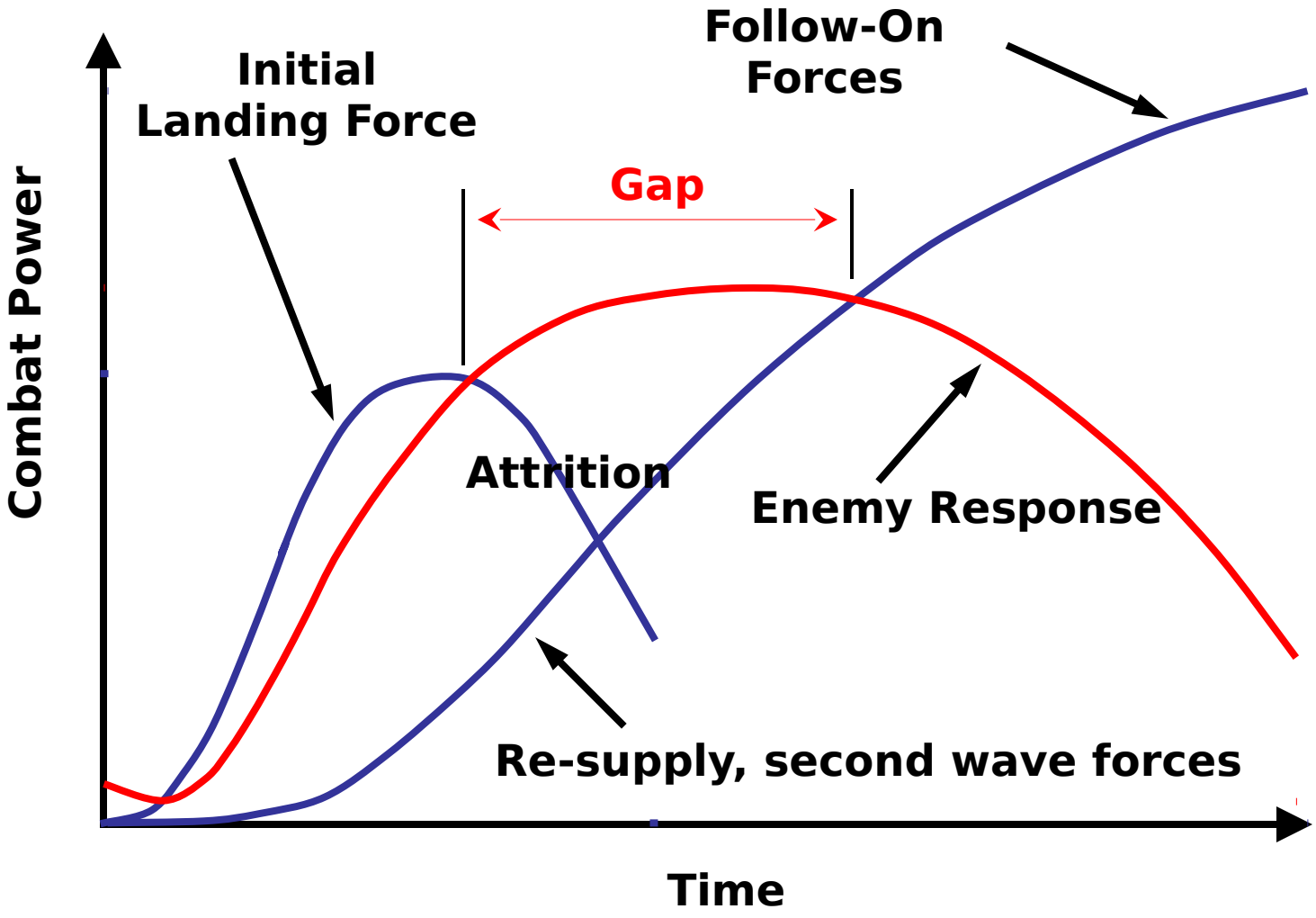
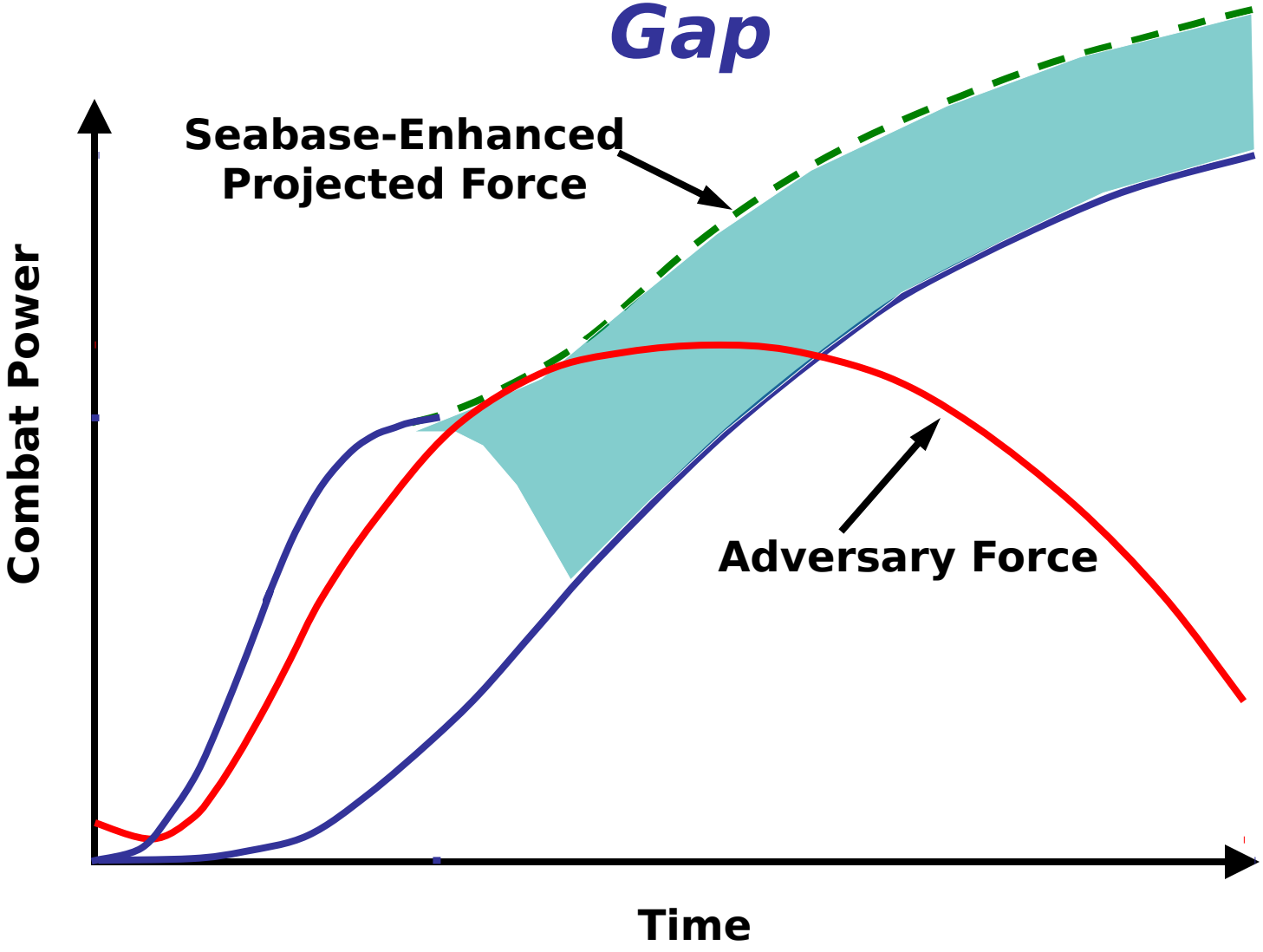


Sea-Based Sustainment can Reduce or Eliminate Vulnerability Gap



Forcible Entry from the Sea Requires

- All functions performed on the seabase
  - Moving forces, materiel, and weapons from an advanced base (or CONUS) to the seabase
  - At sea reception, staging, onward movement and integration
  - Getting the force to the objective and sustaining it
  - Sea, air and land platforms working in concert to project power to the objective (including ESG, CSG, MPG, CLF, air and sea links plus lighterage)
  - Defense suppression
- A ***joint system*** extending across interoperable platforms, netted together and sustained from the sea
- ***Much more than logistics – it's operations!***

The Seabase System of Systems

It's not just a bunch of ships

- Consists of interacting platforms and capabilities
- Must conform to an overall architecture
  - Allows for progression from the present to the future
  - Allows for CONUS-to-seabase deployment and sustainment using military and commercial transport
- Self defense
  - Capability for optimally pairing fires and force protection
- Can sustain operations for prolonged periods
  - Until follow-on forces arrive
  - Serve as a support base thereafter
- C2 systems
- Logistic systems
- Naval surface fire support

Future Sea-Based Capabilities

- Conceptually, a nominal seabase consists of
  - One Expeditionary Strike Group (ESG)
  - A Carrier Strike Group (CSG)
  - A Maritime Prepositioning Group, supported by a combat logistics force (CLF)
  - Specialized supporting vessels
  - Incorporated forces
  - Numbers may vary depending on the size and complexity of operations
- Proposed seabasing CONOPS call for employing equipment and logistics capabilities from advanced bases outside the theater of operations, within approximately 2,000 miles
- Seabases would enable sizable, rapidly deployable forces to operate independent of in-theater seaports or airbases
- Over the next two decades, U.S. sea basing capabilities could evolve sea-based operations in littoral regions supported directly from CONUS

The Dirty Dozen

- Twelve Issues the Department must address
  - ***Management***
    1. **A Joint Sea Base Program Office**
       - ***Re-task and reorganize*** existing offices
       - ***Ensure meaningful participation*** by the Army and Air Force in forming a joint capability
  - ***Planning***
    2. **Sustaining Troops Ashore**
    3. **Protecting the Force Ashore**
    4. **Countering Threats**
       - Mines, sea-skimming missiles, subs, small boats
    5. **Concepts of Operations**
       - At sea RSOI, deployment, force protection, sustainment

The Dirty Dozen (cont)

- ***New Capabilities***
  - **6. Cargo transfer at sea**
    - Inter-modal TEUs at SS4
  - **7. Long-range, heavy lift aircraft**
    - HSVs, lighterage, sea-going cargo cranes, skin-to-skin transfer
  - **8. Ships**
    - The platforms of sea basing
  - **9. Communication architecture**
    - A shared data architecture with sufficient bandwidth, redundancy and robustness
  - **10. Logistic support system**
    - Ability to handle all Service materiel interchangeably
  - **11. Inter-theater lift**
    - HSVs, lighterage, sea-going cargo cranes, skin-to-skin transfer capabilities that can operate at SS4
- ***Resources***
  - **12. Development speed and funding**
    - Creative ways to develop and fund construction of a modern sea basing capability

Management: A Joint Sea Base Program Office

- Developing the seabase will be a complex effort
  - Requires an overall system of system architecture that supports CONOPS for a wide range of operations in a wide spectrum of environments
  - Involves the planning and development of ships, aircraft, cargo handling systems, communications and logistics
  - Requires participation of each of the services to ensure compatibility
- A Joint Program Office can handle the size, scope, complexity and duration of the sea basing development effort

Critical Seabase Capabilities Needed

- Improved cargo handling
  - High-tech sea cranes
  - Skin-to-skin transfer
  - Lighters capable of matching the motion of supply ships
  - Not JLOTS
- Heavy lift air vehicles
  - Quad tilt-rotor
  - Large single rotor
  - Fixed-wing
  - Lighter than air cargo movers (e.g., HULA)
- New ships
  - LHA(R) and MPF(F) seabase platforms for heavy lift air vehicles
  - Semi-submersible platforms
  - Automated warehouse ships

Recommendations

- ***Make Sea Basing Joint***
- ***Address the 12 critical issues*** identified in this study – termed the Dirty Dozen
  - Establish management, R&D, development and integration of sea basing elements
- Develop ***at-sea cargo handling capabilities*** that can withstand sea state 4
- Initiate planning and development of a ***sea basable, heavy-lift aircraft*** with a minimum 20 ton capacity and theater-wide range ***as well as the ships from which they will operate***
- Periodically ***exercise sea basing***
- ***Elevate littoral warfare*** in all the Services

Recommendations

Ensure Sea Basing enables Joint Operations_

- Exploit those Joint Force capabilities that enable ***competitive advantage*** when operated from the sea
- ***Insist*** on enthusiastic participation from ***all Services***
- Getting sea basing right is crucial to future U.S. military strength and freedom of action with unilateral actions. Properly underwritten it will provide a strong deterrent
- Sea basing is the middle ground between SOF, Marine small and mid-scale operations, and larger Army operations. Joint forces must have this capability
- The SECDEF should establish a joint management process to initiate and integrate development of the future joint sea basing system of systems

Recommendations

Address the Dirty Dozen

- Establish R&D focus on sea basing technological needs, availability, and tradeoffs
- Prioritize, select options, and fund spiral seabase development. At current funding levels, the future seabase is a long way off (20 years +)
- Should be treated as an operational capability, not just logistics
- Integrate near, mid, and long-term needs and capabilities
- Realistic logistic support of large forces from a seabase requires:
  - At-sea cargo handling capabilities
  - A new heavy lift, sea-based, aircraft
  - Matching ship designs

Recommendations

- Develop ***at-sea cargo handling capabilities*** that withstand sea state 4
  - Selective, automated cargo movement within seabase warehouse ships
  - At-sea transfer from vessels to lighters inside well decks
  - At-sea cargo transfer to and from lighters alongside seabase ships
  - At-sea transfer from black hull commercial vessels to seabase ships
- Stabilized cranes, ship stabilization and skin-to-skin transfer development provides part of the solution
  - More to be done to ensure seabase robustness

Recommendations

- ***Initiate planning and development of a sea basable, heavy lift aircraft with at least 20 ton capacity and theater-wide range***
- Plan design of MPF(F) ships and other aviation-supporting ships in the seabase to accommodate heavy-lifter options
- A variety of concepts are candidates for such a platform

Recommendations

Periodically exercise sea basing capabilities_

- We haven't done a large forced entry operation against a hostile force since Inchon. Yet, it is likely to be the way the U.S. military must fight in the future
- Find and correct the weaknesses in the CONOPS through experimentation
  - Analogous to the Louisiana maneuvers prior to WW II – the way to get the serious bugs out of fighting capabilities before the war
- Eliminate hand-waving solutions to real problems
  - One experiment is worth a thousand opinions
- Require brigade-level seabase tests every three to five years against realistic red team opposition

Recommendations

Elevate the practice of littoral warfare in all the Services

- Stress that littoral warfare is the toughest, real-world challenge to continued U.S. military hegemony
  - Requires our best leaders
  - Must have incentives to undertake such assignments
- Make meaningful sea basing experience a ***strong plus*** for promotion to senior command rank
  - Increase prospects for promotion to three and four star ranks for littoral warfare officers
- Littoral warfare demands realistic protection of forces afloat and ashore
  - Mines, sea-skimmers, subs, fast response to calls for fire
  - All Services must contribute

Detailed Briefing

Outline

- Geopolitical and Military Environment
- A Sea Basing Concept for the Future
- The Value of an Operational Sea Base
- Enabling Sea Basing Capabilities
  - The Dirty Dozen
- Conclusions and Recommendations

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Geopolitical and Military Imperatives

- The United States confronts increasing challenges to projection of its military power
  - U.S. military increasingly based in North America (although Naval expeditionary forces remain forward deployed)
    - Decreasing access to overseas fixed land bases for political and military reasons
  - Political constraints
    - The United States was denied use of some of its bases during the Cold War
    - Increasingly so over the past decade
    - The refusal of Turkey to grant access in return for $6 billion and loan guarantees a harbinger of the future

Geopolitical and Military Imperatives

- Political costs of land basing
  - U.S. paid stiff political price for continued basing of its forces throughout the Middle East in the 1990s
- Military constraints on land basing
  - Increasingly precise cruise and ballistic missiles available to adversaries
  - Special forces, commando, and terrorist threats also increasing
  - Large footprints ashore = large, immobile targets
- Bottom Line
  - More capable seabases will provide means to project power with less political cost and reduced vulnerability

Geopolitical and Military Imperatives

- The Strategic Imperatives
  - The Hart-Rudman Commission

Even if we retain the necessary bases and port infrastructure to support forward deployed [land-based] forces, they will be vulnerable to strikes that could reduce or neutralize their utility. Precision strikes, weapons of mass destruction, and cruise and ballistic missiles all represent threats to our forward presence as stand-off ranges increase. So, too, do they threaten access to strategic geographic areas.

Geopolitical and Military Imperatives

- Future seabases would possess flexible capabilities to enable a wide spectrum of operations from humanitarian activities to war
- Likely future operations will be within range of the sea, including the “Asian Crescent” from North Korea to the Middle East, South America and Africa
- Sea basing ***must enable joint operations***
  - Efforts toward jointness must not hold up Marine / Navy progress
  - Sea basing efforts should aim at integrating service capabilities

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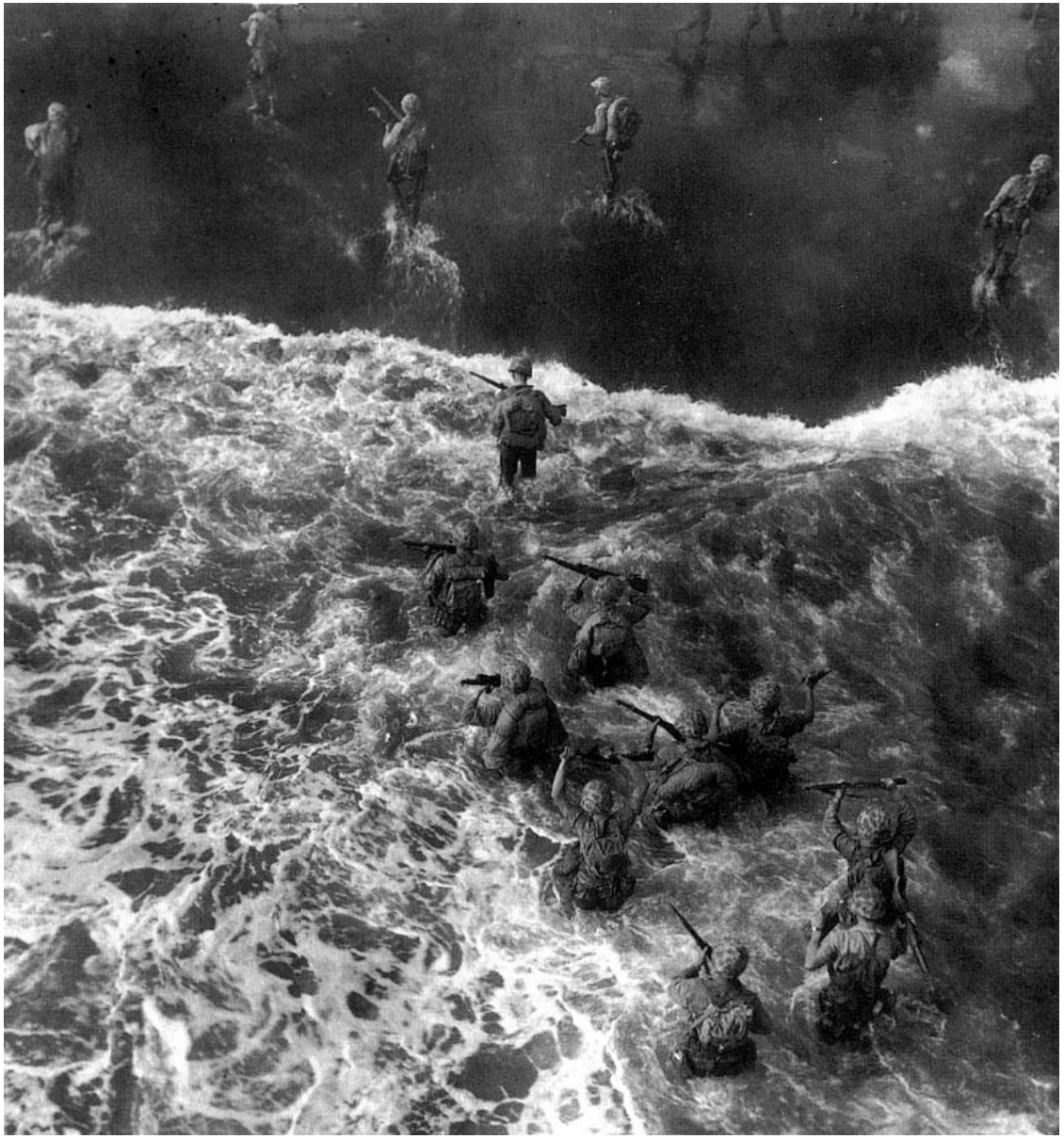

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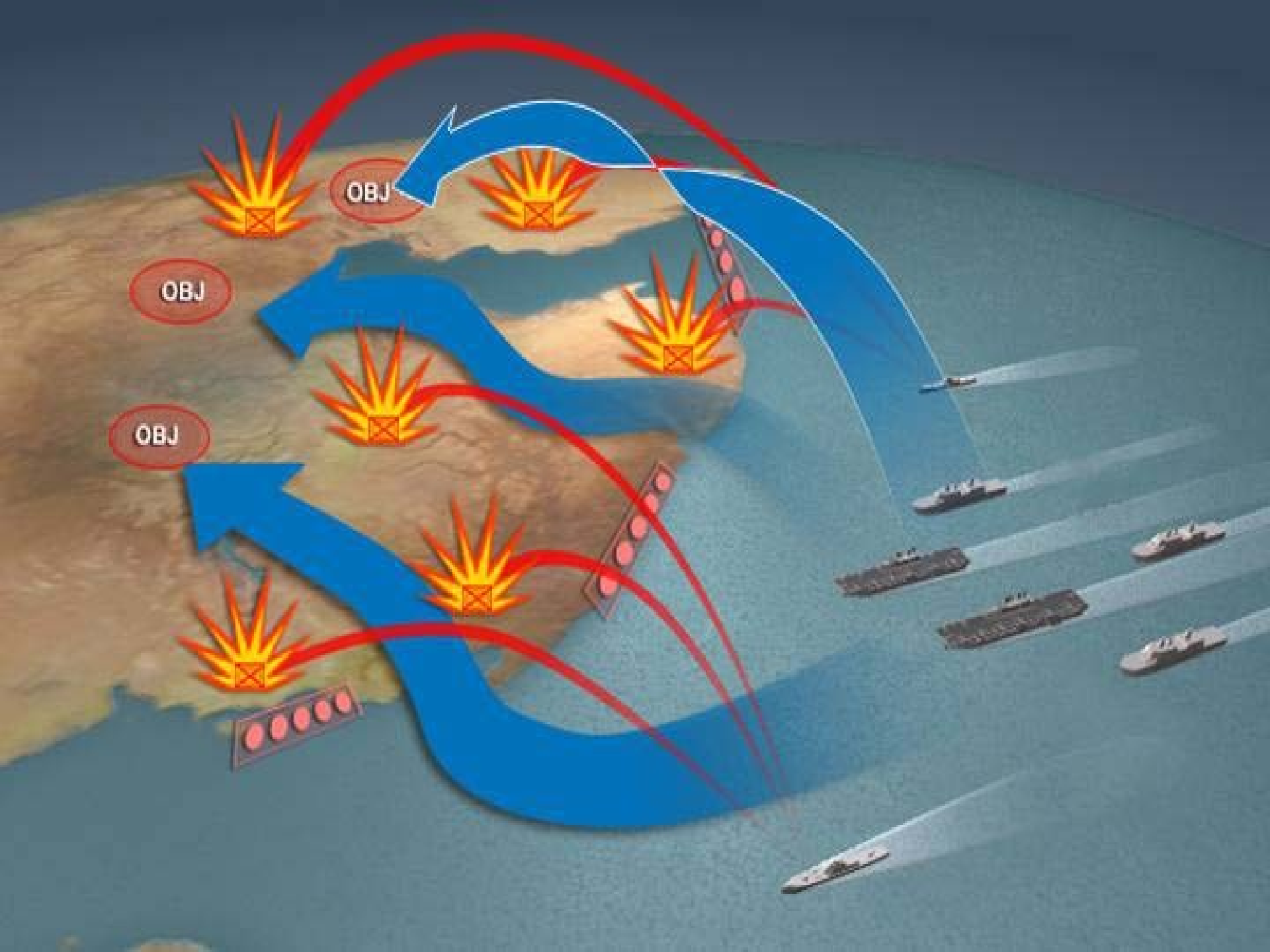
- ***Sea basing expands current amphibious capabilities*** in both scale and scope to enable rapid response, deep, joint, prolonged operations

Today's Amphibious Operations

Today's Amphibious Operations Capability

- Worldwide USMC/USN forward presence with three Amphibious Ready Groups (ARG)
  - Responsive forces for MEU/SOC missions
  - Little capability for sustained land combat
- 2-plus Brigade amphibious lift capability
  - Limited stand-off from beaches
  - Requires large logistical footprint ashore
  - Little naval surface fire capability; heavy reliance on air
- 3 Brigade equipment sets on MPF
  - Require unopposed environment
  - In-stream offload at sea state 2

Seabase Enabled Forcible Entry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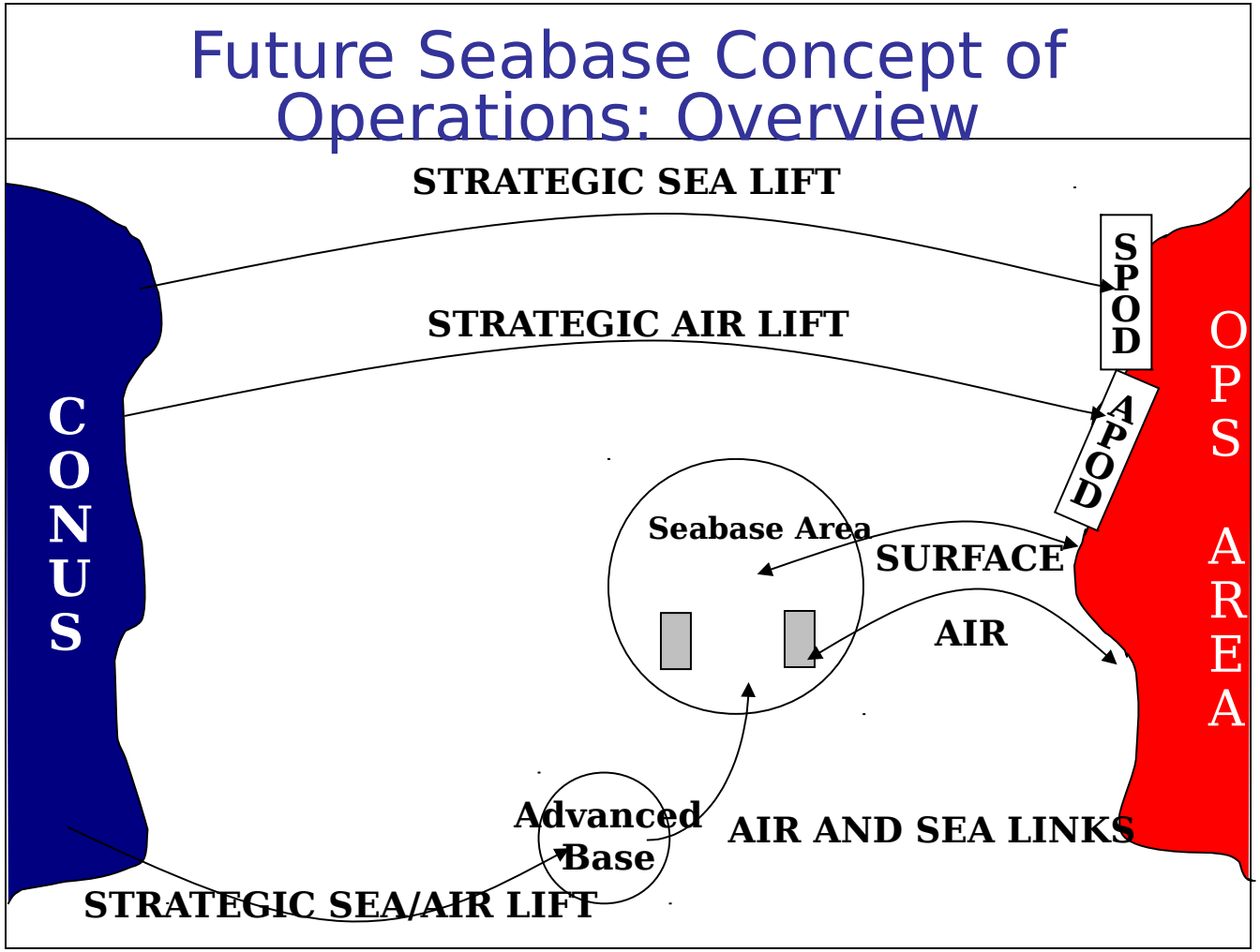
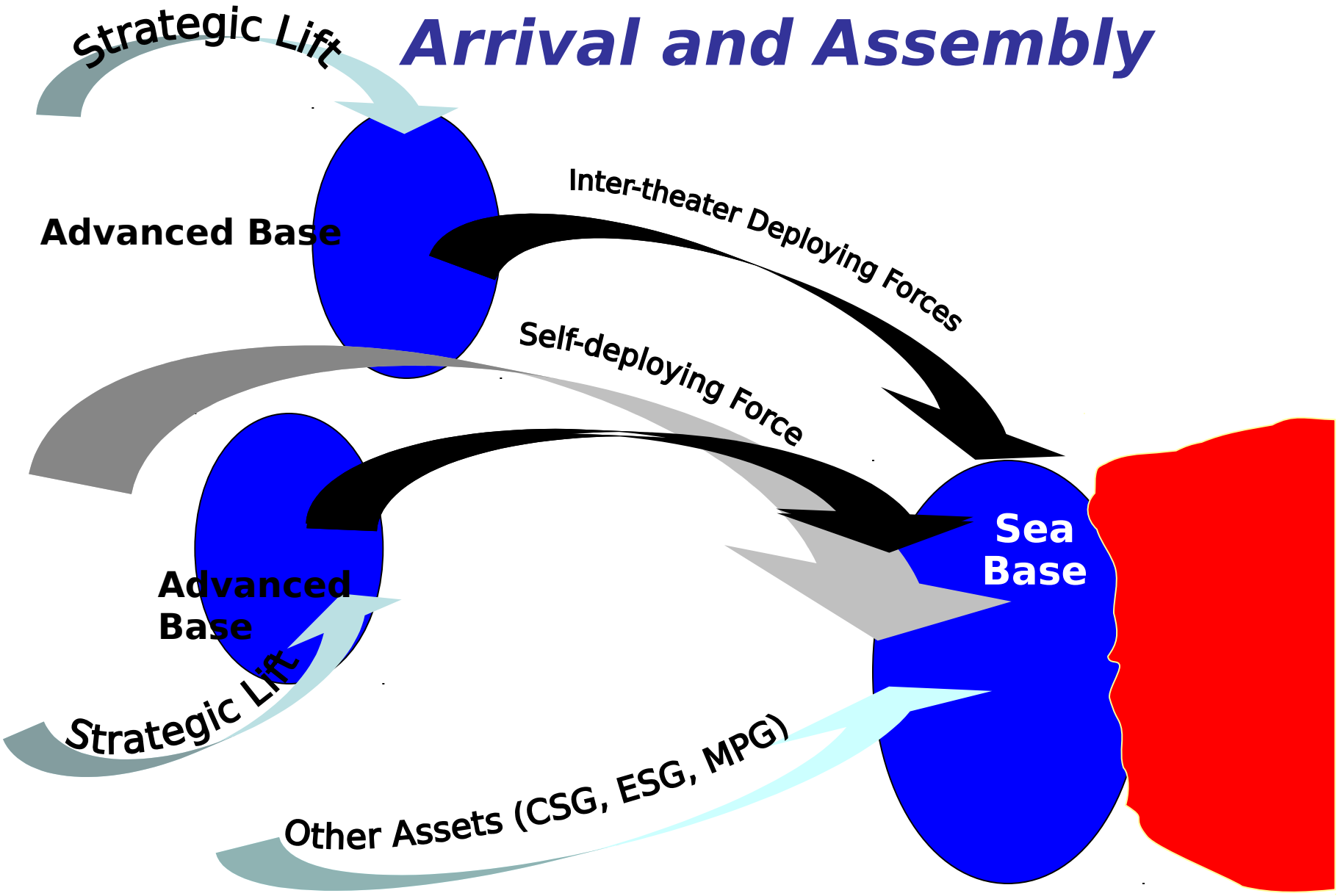
Future Seabase Concept of Operations: Overview

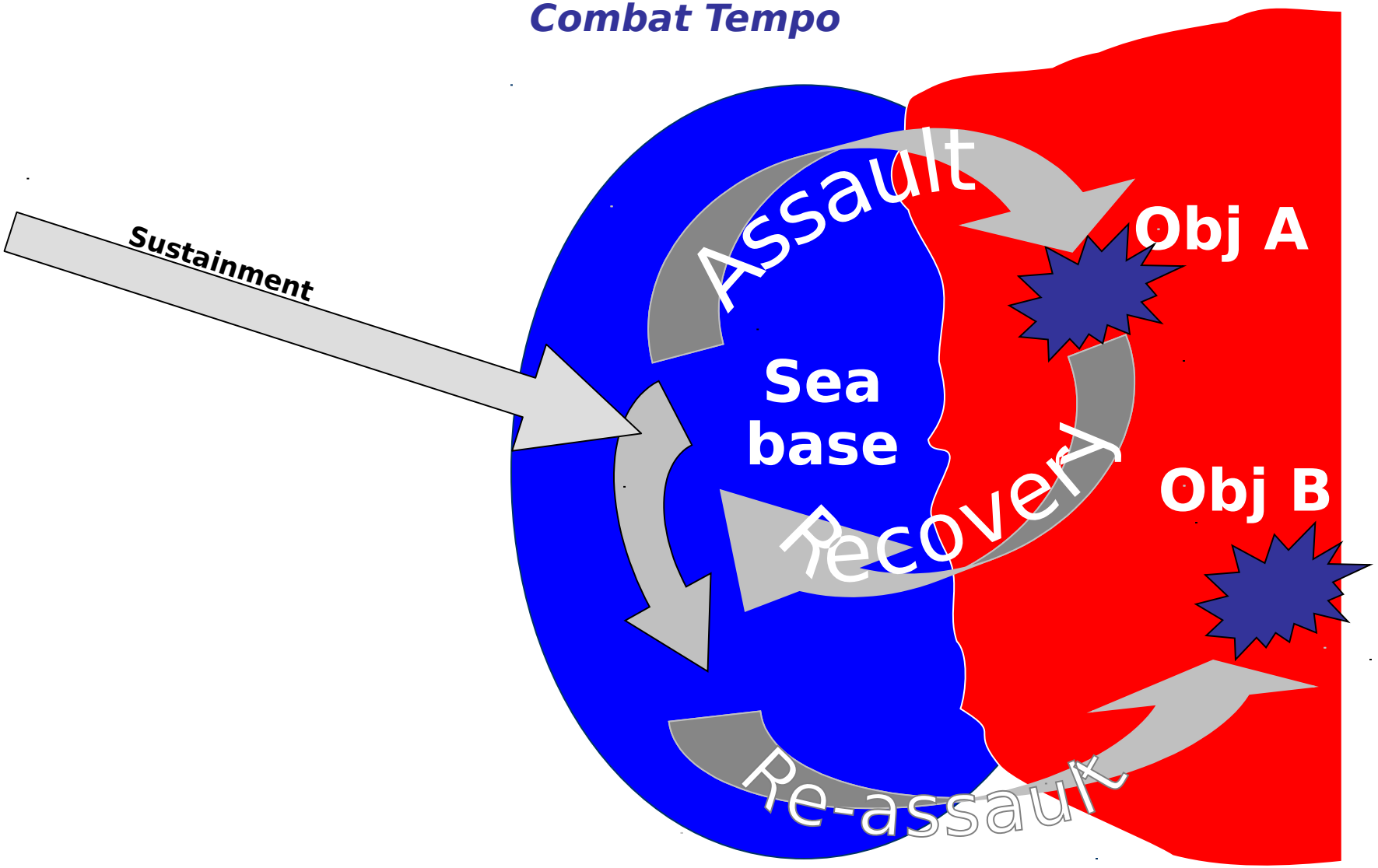


Phased At-Sea Arrival and Assembly



Reconstitution and Redeployment

Rapid Recovery and Re-Employment is Essential to Maintain Combat Tempo



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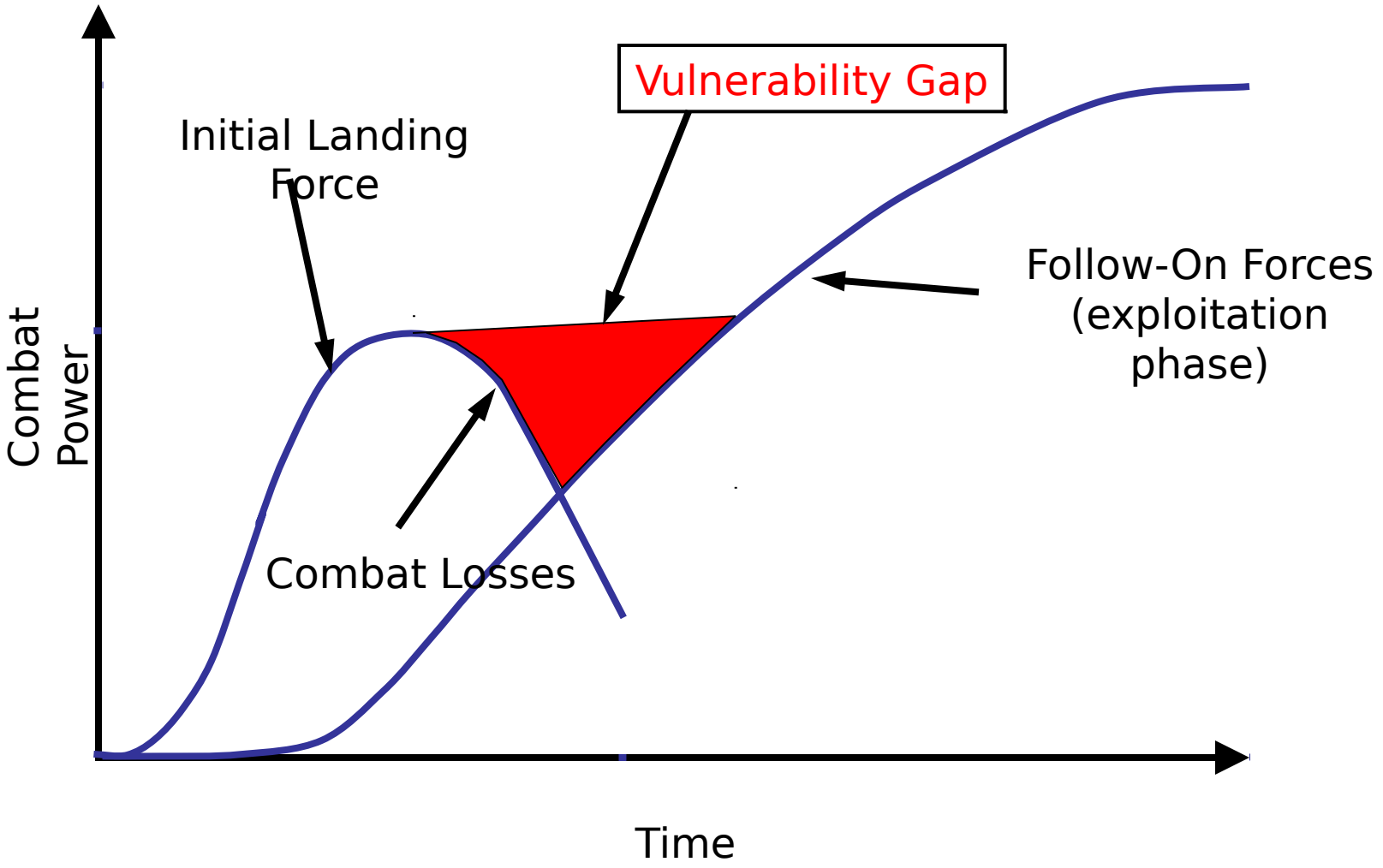
Expeditionary Operations Profile



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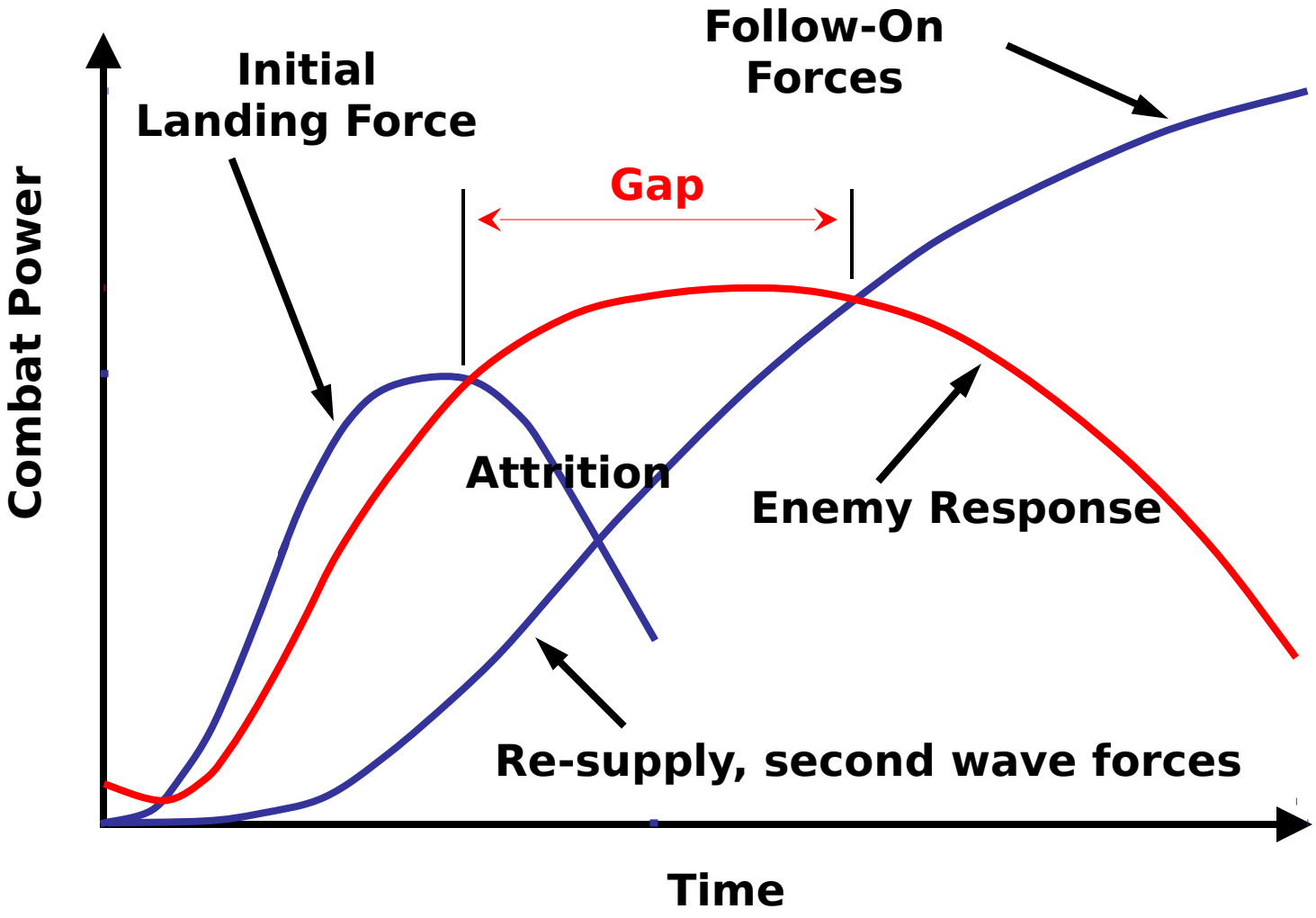

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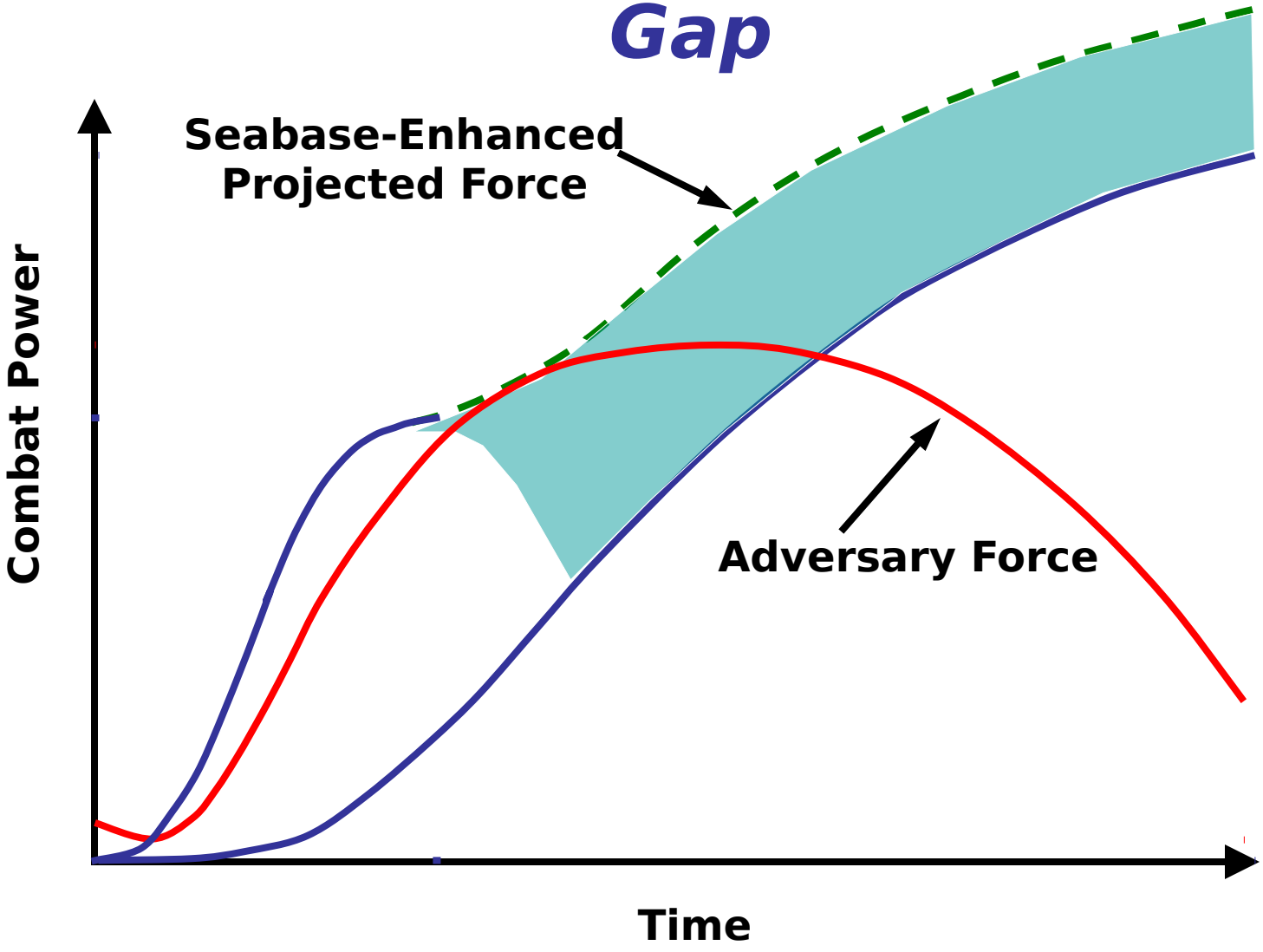

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Forcible Entry from the Sea Requires

- All functions performed on the seabase
  - Moving forces, materiel, and weapons from an advanced base (or CONUS) to the seabase
  - At sea reception, staging, onward movement and integration
  - Getting the force ashore to the fight and sustaining it
  - Sea, air and land platforms working in concert to project power ashore (including ESG, CSG, MPG, CLF, air and sea links plus lighterage)
  - Defense suppression
- A ***joint system*** extending across interoperable platforms, netted together and sustained from the sea
- ***Much more than logistics – it's operations!***

Critical Seabase Capabilities

- Fully joint capable
- Maneuverable, dispersed – able to coalesce rapidly as needed
- Integrated command and control
- At-sea arrival, assembly, and transfer of materiel and personnel
- Selective, robust offload
- Conduct and sustain forcible entry and subsequent operations
- Facilitate movement ashore
- Force protection
- Re-suppliable throughout the follow-on force build up period in adverse weather
- Ability to reconstitute and redeploy the force
- Robust in challenging seas

Sea State

- Sea conditions, described using the Beaufort Scale can limit littoral operations.
- The percentage of Sea State 3 (relatively benign conditions) or less for various littoral areas (see Appendix F for details):

Western Atlantic	60	Mediterranean Sea	75
Eastern Atlantic	40	Persian Gulf	89
North Sea / English Channel	52	North Arabian Sea	73
Eastern Pacific	45	West Indian Ocean	52
West. and So. Caribbean	53	Cape of Good Hope	21
NE South America	54	Gulf of Guinea	71
Western South Atlantic	43	NW Africa	48
Eastern South Pacific	40	East Coast of Japan	48
NW South America	55	East Coast Philippines	62
Western Central America	73	Korean Coast	71

Seabase Design Tradeoffs

- Fundamental seabase requirements represent tradeoffs among operational concepts, logistical requirements, lift capacity and speed, and defense requirements
- Additional requirements stem from expected sea conditions, cargo packaging, and the need to flexibly integrate the force with its materiel at sea

Seabased Land Force Deployment Operations

- Projected CONOPS envision seabase ships operate at an over the horizon line of departure at least 25 n. mi. offshore
  - Helicopters and tilt-rotor aircraft deploy the airborne force inland
  - 35 knot LCACs and 20+ knot AAAVs, provide transit times of approximately one hour to the beach
- When a beach/lodgment area is required and secured, ships can close to 3 n. mi. or less to support the force
  - Dictated by current fuel and water pumping capability and slow transit speeds of LCUs and lighters (5 to 8 knots) necessary to move heavy equipment
  - Envisioned LCU(R) is a 15 knot vessel able to carry three M1A1/2 tanks
- Heavy lift (TEU) air vehicles capable of operating from the seabase would have great utility
  - Would extend operational possibilities enormously
- Ability to handle cargo up to sea state 4 is crucial

The Dirty Dozen

Twelve Issues the Department must address

Management

1. **A Joint Sea Base Program Office**
   - ***Re-task and reorganize*** existing offices
   - ***Ensure meaningful participation*** by the Army and Air Force in forming a joint capability

Planning

2. **Sustaining Troops Ashore**
3. **Protecting the Force Ashore**
4. **Countering Threats**
   - Mines, sea-skimming missiles, subs, small boats
5. **Concepts of Operations**
   - At sea RSOI, deployment, force protection, sustainment

The Dirty Dozen (cont)

New Capabilities

6. **Cargo transfer at sea**
   - Inter-modal TEUs at SS4
7. **Long-range, heavy lift aircraft**
   - HSVs, lighterage, sea-going cargo cranes, skin-to-skin transfer
8. **Ships**
   - The platforms of sea basing
9. **Communication architecture**
   - A shared data architecture with sufficient bandwidth, redundancy and robustness
10. **Logistic support system**
    - Ability to handle all Service materiel interchangeably
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    - HSVs, lighterage, sea-going cargo cranes, skin-to-skin transfer capabilities that can operate at SS4

Resources

12. **Development speed and funding**
    - Creative ways to develop and fund construction of a modern sea basing capability

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- Consists of interacting platforms and capabilities
- Must conform to an overall architecture
  - Allows for progression from the present to the future
  - Allows for CONUS-to-seabase deployment and sustainment using military and commercial transport
- Self defense
  - Capability for optimally pairing fires and force protection
- Can sustain operations for prolonged periods
  - Until follow-on forces arrive
  - Serve as a support base thereafter
- C2 systems
- Logistic systems
- Naval surface fire support

Management
1. A Joint Sea Base Program Office

- Developing the seabase will be a complex effort
  - Requires an overall system of system architecture that supports CONOPS for a wide range of operations in a wide spectrum of environments
  - Involves the planning and development of ships, aircraft, cargo handling systems, communications and logistics
  - Requires participation of each of the services to ensure compatibility
- A Joint Program Office can handle the size, scope, complexity and duration of the sea basing development effort

Planning
2. Sustaining Troops Ashore

- Current CONOPS call for troops to depart from 25 n. mi. offshore
- This departure distance results from the radar horizon and the 35 kt speed of LCACs and 20+ knot speed of AAAVs and endurance of assault troops.
  - 25 n. mi. is over the horizon – an important element of surprise
  - At 25 n. mi., defense against sea-skimming missiles must detect, target, and kill threats in a minute or less.
  - Lines of departure 75 to 100 miles offshore decrease large ship vulnerability, but make lighters impractical
  - Additional threats, such as mines, complicate over-the-beach logistics
  - Ships must eventually move close to the beach to deliver heavy weapons, such as tanks
- A sea-based, heavy lift aircraft, capable of transporting a TEU load 300 miles is crucial for sea basing
  - Avoids the vulnerability / transit time
  - Speeds delivery of supplies from ship to shore

Planning
3. Protecting Forces Ashore

- Traditionally, naval forces have protected forces ashore from the sea through a combination of fire support brought ashore, NSFS, missiles, and air support
  - NSFS lacks the range and precision to protect forces 200 miles inland
  - Current cruise missiles (Tomahawks) are too large and expensive for close support of troops
- The seabase must be able to protect troops ashore against missile attack as well as provide ISR, strike and close air support
  - Forces ashore and at sea must have a common picture of the battle space
  - Cooperative engagement technologies, where sensors ashore (such as radars) link to systems at sea, are key

Planning
4. Countering Threats

- Many ships constituting the seabase will have large displacements (>100K tons). A number of threats could compromise the ability to perform their missions:
  - *Obstacles and Mines*: Principally a shallow water threat (<100 fathoms) Current and developing Navy mine clearing capability is slow and difficult to conceal. Best approach now is detection and avoidance. More effort is urgently needed on mine clearing technologies
  - *Sea Skimming Missiles*: Short flight times make rapid detection, targeting, and kill a must. Persistent shipboard and airborne ISR is a must, as are rapid response antimissile defenses
  - *Submarines*: Long a Navy strength, anti-submarine defenses, as presently constituted, appear adequate against identified threats
  - *Small Boats*: The projected Littoral Combat Ship (LCS) will be well prepared to deal with the small boat threat

Planning
5. CONOPS

- Shore defenses threaten the movement of ships to the 25 n. mi. line of departure necessitated by the radar horizon and current lift capability
  - Portable, easily concealed anti-ship missiles must be cleared early in the conflict
    - A task which may involve FOPEN sensors or special ground ops to complete
  - Rapid, means for clearing mines not available at present
- The success of planning CONOPS is sensitive to a number of factors:
  - If enemy defenses force seabase ships farther offshore, current deployment systems will not suffice
    - From 100 n. mi., an LCAC round trip to shore requires 6 hours; an LCU 24 hours
    - At 100 n. mi. offshore, helicopter and tilt-rotor range is limited to ferrying troops and materiel 50 miles inland
  - If heavy lift, sea-based aircraft (MV-22s are medium lift vehicles) are not available, the range and payload of helicopters (CH53E) are inadequate to reach deep inland objectives
  - If mine and shore-based missile threats cannot be avoided or cleared quickly, heavy materiel (Abrams tanks, AAAVs, bulk POL) cannot move ashore quickly, thus limiting initial commitment to light forces

Critical Seabase Capabilities Needed

- Improved cargo handling
  - High-tech sea cranes
  - Skin-to-skin transfer
  - Lighters capable of matching the motion of supply ships
  - Not JLOTS
- Heavy lift air vehicles
  - Quad tilt-rotor
  - Large single rotor
  - Fixed-wing
  - Lighter than air cargo movers (e.g., HULA)
- New ships
  - LHA(R) and MPF(F) seabase platforms for heavy lift air vehicles
  - Semi-submersible platforms
  - Automated warehouse ships

New Capabilities
6. Moving Heavy Loads At Sea

- Future seabases will require four separable at-sea cargo transfer processes
  - Selective cargo movement within ships
  - At-sea transfer from vessels to lighters inside well decks
  - At-sea transfer to and from lighters alongside seabase ships
  - At-sea transfer from black hull commercial vessels to seabase ships
- For heavy loads, these processes differ
- Stabilized cranes, together with means to stabilize ships, offer limited technological options for at-sea cargo transfer

At Sea Transfer of Personnel, Inter-modal Containers and Out-sized Equipment

- Transfer of personnel and materiel to, from and within the seabase is key to success
- Materiel packaged for shipment on black hull ships today arrives in standard containers (TEUs)
- Materiel carried by MPF(F) ships is loaded months, sometimes years before need
  - Optimum mix and order of cargo are impossible to predict
  - MPF(F) ships must have selective offloading capability
- Equipment to handle inter-modal containers at sea does not now exist

New Capabilities
7. Heavy-Lift Air Vehicles

Heavy Lift Air Vehicles

- Current and programmed air vehicles limit seabase ability to provide rapid, flexible force projection
  - In some planning scenarios, an entire brigade ACE (MV-22s and CH53s) is necessary to provide the transport and supply demands of the GCE leaving no capability for subsequent tactical missions
- Heavy lift air vehicles are valuable maneuver and sustainment assets for
  - Transport for personnel and materiel to the seabase from remote advanced bases
  - Movement and supply of forces ashore
  - Persistent platforms for ISR, tankage, look-down defense radar and weapons delivery

Heavy Lift Aircraft

- A sea basable, long-range, heavy lift aircraft capable of supporting the force ashore, organic ISR, acting as a loitering weapons platform and tanker, and transporting troops to the seabase from the advanced base has a major effect on seabase flexibility
  - Several options have been developed for such an aircraft, such as quad-tilt rotor, large blade helicopters, fixed wing aircraft and lighter than air lifting bodies
  - The aircraft should be capable of lifting TEU loads for distances of 300 miles
    - It should be resident on the seabase
    - It should be capable of ferrying troops to the seabase and from the seabase to the land battle area

New Capabilities
8. Ships: The Platforms for Sea Basing

- Two ship development challenges
  - New designs for existing ship-types that can adapt to future seabase needs
    - LHA(R)
    - MPF(F)
  - Examination of potential revolutionary vessel designs specifically aimed at seabase applications
    - Mobile Offshore Base (MOB)
    - Semisubmersible structures

The LHA(R) Design

- Current design falls short of future sea basing needs in the following areas
  - Space to support air operations
  - Capacity to house troops
  - Ability to transfer cargo in heavy seas
  - Ability to sustain prolonged operations
- New designs must be flexible enough to adapt to the overall sea base architecture

MPF(F) Support for Air and Cargo Operations

- STOM CONOPS envision all 87 rotary wing aircraft in the ACE operating off six MPF(F) ships
  - Includes 40 MV-22 tilt-rotor and 20 CH-53E helicopter aircraft
  - Future options may include fixed wing aircraft
  - Other CONOPS alternatives are under consideration
- A flight deck / hangar deck to accommodate 10 MV-22 and 4 CH-53E requires 33 spots. Today's LHA has 42 spots: an LHD has 45 spots
- Stowage of significant numbers of 20-foot TEU containers at a 70% load factor would foul 25% of an LHD-sized flight deck, rendering the area unusable
- The total cargo stowage and aircraft requirements for the MPF(F) necessitates ***large deck areas suitable for flight operations***

Mobile Offshore Bases

- The Joint Mobile Offshore Base (JMOB) builds on oil industry experience with large, floating drilling platforms
  - Consists of 1,000 foot sections linked to form a runway capable of handling large aircraft
  - Cost per section is approximately $2B
- JMOB advantages include
  - Stability
  - Large Storage Volume
  - Flexibility to deploy single sections to support helicopter operations
- The JMOB, however, has important drawbacks
  - Slow transit speeds and slower maneuvering speed once deployed compared to other seabase components
  - High cost
  - Lack of flexibility in use
  - Easier to target due to slow speed, once deployed

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Large, Semi-Submersible Platforms

- Large-platform, built on oil industry experience with semi-submersible drilling platforms, is a possibility
  - A 500 by 1000 foot or larger multi-deck structure possible
  - Cost is estimated to be approximately $2-3 B
- Large platform advantages include
  - Stable in high seas
  - Large storage and cargo handling volume
  - Acceptable transit and deployment speeds
    - De-ballasts for transit speed, re-ballasts for deployment stability
  - Artificial lees for loading lighters
  - Ramps and cranes for unloading inter-theater transport ships
- Such large vessels make the seabase platform-centric, reducing flexibility and maneuverability
- Other semi-submersible vessel possibilities

One Example of a Large, Semi-Submersible Support Platform

TRIMERSIBLE™
LOGISTICS AND MAINTENANCE BASE
Trimersible™
Logistics and Maintenance Base Particulars
Length, Overall 1,181 ft
Breadth, Overall 656 ft
Depth, Overall 233 ft
Depth, Upper Box 62 ft
Draft, Transit 46 ft
Draft, Operating 89 ft
Lightship Weight 234,833 st
Displacement, Transit 369,338 st
Available Deadweight, Transit 134,505 st
Displacement, Operating 588,735 st
Available Deadweight, Operating 355,005 st
Operations Deck Area 559,778 ft²
Container Storage Below Deck 2,725
Vehicle Storage Below Deck 724
Hangar Floor Space Below Deck 150,709 ft²
Superstructure Floor Space 226,064 ft²
(for offices, accommodations and hospitals)
Unallocated Floor Space in Upper Box 1,205,676 ft²
(for machinery, storage and additional accommodations)
Beds over 5,000
Fluid Storage Volume 7,876,324 ft³

Source: Kellogg, Brown & Root

New Capabilities
9. Communications

- Current ship-to-shore communications are inadequate to support fully integrated seabase command, operations, logistics and defense
  - Operational and logistical communications are not integrated
  - Robust voice and wideband data communication links of 200 miles (OTH) are basic requirements in planning CONOPS
  - Communications failures prompt commanders to maintain “safety stocks” of supplies to guard against the possibility of logistics failure, clogging distribution channels
  - Reliable wideband communications over future areas of operations will require airborne or satellite repeaters
- Communications needs increase when the seabase serves as the command center for Joint Task Force
  - Broadband video conferencing and satcom voice and data links to CONUS are basic requirements

New Capabilities
10. Logistic Support System

- Existing logistics systems are inadequate for seabase missions
  - Seabases will serve as transshipment points for materiel arriving on black-hull cargo vessels and MPF(F) ships—sorting, repackaging, and integrating areas where troops, equipment, and forwarding services are mated to deploy and supply forces ashore
  - Such activities must occur under sea conditions likely to prevail
    - New lighterage and cargo handling systems basic requirements
    - Heavy lift aircraft, capable of using the seabase, to allow forces ashore to rely on modest supply inventories
  - Current information systems do not support the logistics-intense seabase activity
    - Existing systems allow visibility into in-transit and inventoried supplies
    - Do not yet work with other Services' logistics systems
    - "Demand pull," allowing task force commanders to tailor logistics needed from anywhere in the pipeline, is nonexistent

New Capabilities
11. Intra-Theater Lift

- Multiple ships operating in the same area will form part of the seabase
  - Fundamental need for rapid, flexible cargo and personnel movement among the ships and from sea to land under most sea conditions
- Several critical problems need addressing
  - Higher speed, shallow draft vessels with sea keeping properties to allow loading and unloading under challenging sea conditions
  - Ship-to-ship load transfer at sea – deep draft vessels, SWATH configurations, or moon pools
  - Cargo packaging that makes best use of existing capabilities until new, heavier load methods are in place

Resources
12. Development Speed and Funding

- A clear vision for sea basing must precede development of systems needed to ensure mission and system compatibility
- The need for high priority development programs is clear
  - A TSV/HSV program to develop capacity consistent with operational needs of seabases
  - Develop an interface that allows fast ships and MPF(F) ships to exchange personnel and cargo at sea
  - Dramatic improvements in countermine, missile defense, and high sea cargo handling capabilities
  - A black-bottom to MPF(F) at sea cargo interface capable of SS4
  - Systems to move large loads selectively within an MPF(F) in high seas
  - A sea basable, heavy-lift (20 ton), aircraft with a 300 n. mi. range (100 n. mi. at sea, 200 inland) together with supporting ships
  - A multi-mission aircraft of this type would have a major operational and logistic impact and provide a platform for organic ISR, air-to-air refueling, gun ships and, most important, persistent look-down, early warning of sea-skimming missiles

Outline

- Geopolitical and Military Environment
- A Sea Basing Concept for the Future
- The Value of an Operational Sea Base
- Enabling Sea Basing Capabilities
  - The Dirty Dozen
- Conclusions and Recommendations

Conclusions

- Sea basing represents a critical joint military competence to project forces rapidly from the United States
- Future sea basing needs are beyond current operating capabilities of the maritime services
- Complexity and difficulty of sea basing requires coordinated, evolutionary development of joint sea basing systems of systems
- The United States should exercise its sea basing capabilities realistically to work out problems and develop expeditionary warfare skills

Recommendations

Ensure Sea Basing enables Joint Operations_

- Exploit those Joint Force capabilities that enable ***competitive advantage*** when operated from the sea
- ***Insist*** on enthusiastic participation from ***all Services***
- Getting sea basing right is crucial to future U.S. military strength and freedom of action with unilateral actions. Properly underwritten it will provide a strong deterrent
- Sea basing is the middle ground between SOF, Marine small and mid-scale operations, and larger Army operations. Joint forces must have this capability
- The SECDEF should establish a joint management process to initiate and integrate development of the future joint sea basing system of systems

Recommendations

Address the Dirty Dozen

- Establish R&D focus on sea basing technological needs, availability, and tradeoffs
- Prioritize, select options, and fund spiral seabase development. At current funding levels, the future seabase is a long way off (20 years +)
- Should be treated as an operational capability, not just logistics
- Integrate near, mid, and long-term needs and capabilities
- Realistic logistic support of large forces from a seabase requires:
  - At-sea cargo handling capabilities
  - A new heavy lift, sea-based, aircraft
  - Matching ship designs

Recommendations

- Develop ***at-sea cargo handling capabilities*** that withstand sea state 4
  - Selective, automated cargo movement within seabase warehouse ships
  - At-sea transfer from vessels to lighters inside well decks
  - At-sea cargo transfer to and from lighters alongside seabase ships
  - At-sea transfer from black hull commercial vessels to seabase ships
- Stabilized cranes, ship stabilization and skin-to-skin transfer development provides part of the solution
  - More to be done to ensure seabase robustness

Recommendations

- ***Initiate planning and development of a sea basable, heavy lift aircraft with at least 20 ton capacity and theater-wide range***
- Plan design of MPF(F) ships and other aviation-supporting ships in the seabase to accommodate heavy-lifter options
- A variety of concepts are candidates for such a platform

Recommendations

Periodically exercise sea basing capabilities_

- We haven't done a large forced entry operation against a hostile force since Inchon. Yet, it is likely to be the way the U.S. military must fight in the future
- Find and correct the weaknesses in the CONOPS through experimentation
  - Analogous to the Louisiana maneuvers prior to WW II – the way to get the serious bugs out of fighting capabilities before the war
- Eliminate hand-waving solutions to real problems
  - One experiment is worth a thousand opinions
- Require brigade-level seabase tests every three to five years against realistic red team opposition

Recommendations

Elevate the practice of littoral warfare in all the Services

- Stress that littoral warfare is the toughest, real-world challenge to continued U.S. military hegemony
  - Requires our best leaders
  - Must have incentives to undertake such assignments
- Make meaningful sea basing experience a ***strong plus*** for promotion to senior command rank
  - Increase prospects for promotion to three and four star ranks for littoral warfare officers
- Littoral warfare demands realistic protection of forces afloat and ashore
  - Mines, sea-skimmers, subs, fast response to calls for fire
  - All Services must contribute

Backup
Terms of Reference

Sea basing Task Force – TOR summary

You are requested to establish a Defense Science Board Task Force to:

- Assess how sea basing of expeditionary forces can best serve the nation's defense needs through at least the first half of the 21st century
- The 2001 QDR has reinforced the shift in the Navy's focus from open water to littoral regions.
  - Concentrate on the need for the presence and warfighting missions that expeditionary forces perform
  - Examine their utility and their potential for transformation
- The Navy and the Marine Corps have generated a concept for future expeditionary warfare, "Enhanced Network Sea Basing," which is to be the starting point for the study

Sea Basing Task Force – TOR summary

- Consider the operational requirements, the assets required, the role(s) of new technologies, and the effects of “jointness”
- Examine the future relationships of the Amphibious Ready Group, with embarked Marine Expeditionary Unit, Carrier Battle Group, Maritime Prepositioning Ship Squadron, Marine Expeditionary Brigade, Surface Action Group and the Combat Logistics Force in establishing the Enhance Network Seabase and implications for platform costs and capabilities.

Sea Basing Task Force – TOR summary

- Be guided by the following questions:
  - What is the naval environment expected to be for the next 20-50 years?
  - What is the role of naval forces in enabling access for joint forces through the world's littorals?
  - What assets and technologies are needed to establish a robust and capable Enhanced Networked Seabase?
  - How does the timing of the acquisition of the technologies, platforms and systems which replace legacy systems build up full capability from what it is now?
  - As new hardware is acquired, should the function each legacy platform performs remain the same or are the opportunities to relocate functionality to improve effectiveness, efficiency or economy?
  - Are there other Doctrine, Organizational, Training, Materiel, Leadership, Personnel or Facilities (DOTMLPF) aspect the affect the development?